REMARKS/ARGUMENT

Regarding the Claims in General:

Claims 57-62, 64-65, 67-78, 81-82, 84-86, 88-100, and 102-106 are now pending. Claims 59-62, 65, 71, 73-76, 84-86, 88-92, 97, 100, 102-104 have been amended to improve the form thereof, to better highlight the distinguishing features of the invention, and to better conform to U.S. claim practice.

The amended claims have not, however, been narrowed in scope.

Claims 105 and 106 have been added to provide applicants with additional protection to which they appear to be entitled.

Regarding the Objections to the Claims and the Rejection under 35 U.S.C. 112:

The amendments to the claims address the objections and the rejection stated in Sections 3, 5, and 7 of the outstanding Office Action.

Regarding the Prior Art Rejections:

Reconsideration and withdrawal of the outstanding rejections under 35 U.S.C. 103 based on the Peters et al. U.S. Patent 5,550,375 (Peters), the Baxter U.S. Patent 4,111,717 (Baxter), the Grinberg et al. U.S. Patent 4,922,116 (Grinberg), the Dschen Published German application 41 10 653 (Dschen), and the Chen and Larsson articles is respectfully requested.

Independent apparatus claim 102 is directed to a gas detector, and independent method claim 104 is directed to a method for forming a gas detector. These claims have been rejected as unpatentable over Peters in view of Dschen and the Chen article.

Claim 102 as amended calls for a gas detector comprising a gas cell formed of a plastic base plate and a hollow plastic chamber extending from a surface of the base plate, a source of electromagnetic radiation *outside the chamber* coupled to the gas cell for emission into the chamber, and an electromagnetic radiation detector formed on a three-dimensional topographical structure integral with the base plate and located *inside* the chamber.

The Examiner has recognized that the principal reference, Peters, does not teach or suggest the subject matter of this claim, but perhaps he does not appreciate the extent to which this is so. Although the distinguishing features of claim 102 relative to Peters have always been present, claim 102 has been amended to further highlight these differences. In particular, claim 102 now specifies that the electromagnetic radiation detector is:

> formed integrally with the base plate, and located inside the chamber...

and is comprised of:

> a three-dimensional topographical structure formed on the baseplate within the chamber; and
>
> first and second electrically conductive metal layers on the topographical structure,
>
> the metals of the first and second electrically conductive layers being so chosen and positioned that they cooperate to form a thermoelectric element.

The claimed structure, and the location within the gas cell chamber are totally absent from Peters.

The German application of Dschen and the Chen article (obviously th same individual) does disclose forming thermoelectric devices by depositing two metal coatings on a three-dimensional structure from two different angles. However, the devices disclosed in these references are used as catalytic converter sensors in a high temperature environment (e.g., 300° C). These sensors are designed for detection of large temperature differences, and there is no suggestion that such a device would be useful in an application such as that of Peters, where the object is to measure infrared absorption at one of the junctions.

The fact that improving the sensitivity of the detector in Peters might be desirable does not make it obvious to use the thermoelectric devices of Dschen (Chen) as a means of doing so. There is no suggestion anywhere that those devices can provide improved sensitivity compared to what Peters already has. In fact, in the Chen article, it is specifically stated that the thermal

conductance of the device is still high, thus limiting the sensitivity (see page 362, fifth paragraph of the Introduction section), so how can one say that such a sensor will improve the performance of Peters' device? ***For all one can tell from the published application or the article, such a substitution might result in reduced sensitivity, or no change at all.***

Moreover, even if the thermoelectric devices of Dschen (Chen) were used in the gas detector of Peters, the result would still not meet the terms of claim 102 which requires that the detector be located on the base plate ***inside the gas cell.*** In Peters, the detector is outside the chamber, and there is no suggestion in the Dschen application, the Chen publication, or in any of the other cited prior art to place the detector inside the chamber.

The fact that the radiation detector of Peters is located outside the chamber was pointed out in response to the previous Office Action, but inexplicably, this was not even addressed in the outstanding Office Action. If this rejection is adhered to, the Examiner is respectfully requested to point out a suggestion in the prior art which would legitimately motivate one skilled in the art to completely rebuild the device of Peters to put the detector inside the chamber.

The novel and unobvious structure of the device of claim 102 is reflected in the fabrication steps called for in claim 104. These features were always present in claim 104, but in an effort to better highlight the method aspect of this invention, claim 104 has been amended to recite:

> forming a master structure as a pattern for the base plate, the pattern including, in an area corresponding to a portion of the base plate which will be inside the chamber, a three-dimensional structure corresponding to the topographical structure on which the thermoelectric array is to be mounted. . .

As explained above, the device of Peters et al. does not have an IR detector inside the analysis chamber, and motivation for modifying Peters et al. to produce such a structure is not found in the Dschen published application, in the Chen article, or in any of the other secondary references. Accordingly, it can not be obvious from any of the prior to produce a gas detector employing a method including the step quoted above in which a master pattern is formed for a base plate including a topological structure which will be located inside the analysis chamber on which the IR detector will be mounted. Even if the prior art, including Peters, teaches a "LIGA" process doesn't

make it obvious to use such a process to form something which is not taught or suggested by the prior art.

Claims 81-82, 84-86, and 88-100, 103, and 105 are dependant on claim 102, and claims 57-62, 64-65, 67-78, and 106 are dependent on claim 104. These claims are patentable for all the reasons stated above. In addition, these claim recite features which, in combination with the features of their respective parent claims are neither taught nor suggested in the cited references.

In view of the foregoing, favorable reconsideration and allowance of this application are respectfully solicited.

I hereby certify that this communication is being transmitted via facsimile to number (703) 872-9318 on June 9, 2003:

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June 9, 2003
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Respectfully submitted,

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